NOTES ON SOME SPECIES OF *CHIONE* FROM NEW ZEALAND.

By Henry Suter.

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Since 1873 three species of *Venus* from New Zealand, described by Quoy & Gaimard in the Voyage of the "Astrolabe," have been lumped together, viz.: *V. crassa*, *mesodesma*, and *violacea*. As if this had not been enough, *V. denticulata*, Q. & G.,[1] was added, though its habitat is said by Q. & G. to be "Nouvelle Hollande ou Van Diémen." In Hutton's Cat. Mar. Moll. N. Zeal., 1873, p. 70, we find *V. crassa*, *denticulata*, *violacea*, Quoy, *spissa*, Desh., and *spurca*, Sby., as synonyms of *Chione mesodesma*, Quoy. E. von Martens, in the Crit. List Moll. N. Zeal., 1873, p. 45, adopts the same synonymy, adding *V. scansilis*, Römer. In the "Révision des coq. de la N. Zél. et des îles Chatham"[2] Hutton cites *Chione mesodesma*, Q. & G., no synonyms being given. The same synonyms contained in the Catalogue of 1873 are repeated by Hutton in his Manual of 1880, p. 148, and all the synonyms given by Von Martens are also accepted in the "Revision of the Recent Lamellibranchiata."[3] Admitting the above synonymy as correct as far as Quoy & Gaimard's species are concerned, I substituted the specific name *crassa*, Q. & G., for *mesodesma*, Q. & G., as it has priority of seven pages.[4]

Coming quite recently across the descriptions and figures of the above species in the Voyage of the "Astrolabe," I began to have grave doubts whether they were really extreme forms of one species, and I decided to follow up the question. I wish to point out that with regard to *V. spurca*, Sby., *spissa*, Desh., and *scansilis*, Römer, I am unable to decide if they are synonyms of *mesodesma*, Q. & G., or not, and I quote them on the authority of E. von Martens.

The reason for lumping together three species, considered distinct by Quoy & Gaimard, is to be found in the insufficiency of the material available in our collections, a species being usually represented from one or two localities only. Now, when nearly allied species are to be separated, as in the present instance, it is very

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[1] Hedley is inclined to consider this species as a synonym of *Chione gallinula*, Lamk. (Proc. Linn. Soc. N.S. Wales, 1904, p. 195).

[2] Journ. de Conch., vol. xxvi (1878), p. 49.

[3] Proc. Linn. Soc. N.S. Wales (1), vol. ix, p. 523.

[4] Trans. New Zeal. Inst., vol. xxxiv, p. 221; Index Faunæ Novæ Zealandiæ, 1904, p. 89.

probable, that in the collection used for study, only one of the species is represented, and this may be very variable, as is the case with *C. mesodesma*, and so one easily comes to the conclusion that the different species have been established on extreme forms which should be considered as one species only.

Besides this, New Zealand conchologists are greatly handicapped in their work by the want of the necessary literature and type-specimens for comparison. For a number of years I have tried to get specimens from various localities in New Zealand, and to a certain extent have been successful. I have thus been enabled to study carefully these nearly allied forms of *Chione*, and I now venture to publish the result of my investigations.

Chione crassa (Quoy & Gaimard).

Venus crassa, Q. & G.: Voy. Astrolabe, Zool., vol. iii (1834), p. 525, pl. lxxxiv, figs. 7–8.

Venus crassa, Gray: in Dieffenbach's Travels in N. Zeal., vol. ii (1843), p. 250.

Chione gibbosa, Hutton: Cat. Mar. Moll. N. Zeal., 1873, p. 71; Journ. de Conch., vol. xxvi (1878), p. 49; Man. N. Zeal. Moll., 1880, p. 148.

Venus gibbosa, Hutton: Macleay Memor. Vol., Linn. Soc. N.S. Wales, 1893, p. 81, pl. ix, fig. 88.

Chione gibbosa, Suter: Trans. N. Zeal. Inst., vol. xxxiv (1902), p. 222.

Shell globose, orbicular, subequilateral, very thick, umbones hooked, heart-shaped, lunule large and well marked, escutcheon deep. Valves concentrically striated, the costæ partly united and forming bundles of ribs. Colour whitish or yellowish, with two light-reddish bands converging towards the umbo; this number is fairly constant. Interior white, bordered by dark violet. The muscular impressions have pale-reddish striations; the margin is denticulated the whole length, the ventral margin slightly inflexed posteriorly. The three cardinal teeth are strong. Length 27, height 24·75, diam. 18 mm. (Q. & G.).

The lunule is very distinct, rather large, heart-shaped.

I have specimens from Preservation Inlet and Stewart Island. One of the latter has exactly the measurements given above, the others are smaller. The concentric ribs are separated by narrow, deep grooves; they are slightly convex, with a sharp edge above. The pallial sinus is short, regularly triangular, pointing to the anterior adductor muscle.

Chione gibbosa was founded on a single right valve only. In the "Revision of the Recent Lamellibranchiata" Hutton omitted the species as "found fossil only." The Pliocene specimens I possess are less gibbous and smaller, but so is also the recent specimen I have from Preservation Inlet. The fossil specimens agree with the diagnosis and figures of *V. crassa*, Q. & G., fairly well, and Hutton's name therefore becomes a synonym.

C. crassa is a rather rare species now.

CHIONE MESODESMA (Quoy & Gaimard).

Venus mesodesma, Q. & G.: Voy. Astrolabe, Zool., vol. iii (1834), p. 532, pl. lxxxiv, figs. 17–18.
Venus spurca, Sowerby: Proc. Zool. Soc., 1835, p. 23; Thesaurus Conch., vol. ii, figs. 92–97; Reeve, Conch. Icon., figs. 90*a–b*.
Venus spissa, Deshayes: in Lamarck's Anim. s. Vert., 2nd ed., vol. vi (1840), p. 373.
Venus mesodesma, Gray: in Dieffenbach's Travels in N. Zeal., vol. ii (1843), p. 251.
Murcia scansilis, Römer: Mal. Blätter, vol. vii (1860), p. 161.
Chione mesodesma, Hutton: Cat. Mar. Moll. N. Zeal., 1873, p. 70; Journ. de Conch., vol. xxvi (1878), p. 49; Man. N. Zeal. Moll., 1880, p. 148.
Venus mesodesma, Hutton: Proc. Linn. Soc. N.S. Wales (1), vol. ix, p. 523.
Venus crassa, Suter: Trans. N. Zeal. Inst., vol. xxxiv (1902), p. 221 (not Q. & G.).
Chione crassa, Suter: Index Faunæ Novæ Zealandiæ, 1904, p. 39 (not Q. & G.).

The diagnosis is to be found in Hutton's Manual, etc. Quoy & Gaimard remark: "A small species, a little resembling *Mesodesma striata* in form, and the regular longitudinal striæ. The shell is oval, nearly equilateral, light yellowish, with some transverse triangular flames of a pale reddish colour. The interior of the valves is bright violet. The lunule, of the same colour, is elongated oval. The beaks are white; the margin of the valves denticulated on the inner side. There is no anterior lateral tooth. Length 20·25, height 15·75, diam. 9 mm."

This species is easily distinguished from *C. crassa* by its much less gibbous form, the lanceolate lunule, and the less prominent concentric ribs. In colour-markings this species is exceedingly variable, and it is very often beautifully ornamented with zigzag lines. It is the most abundant bivalve on the east coast of the North Island, and especially on Tiri-Tiri Island in the Hauraki Gulf, where I have seen tons of this species piled up on the beach. By dredging in depths from five to thirty fathoms in Hauraki Gulf great quantities of valves are always met with.

CHIONE MESODESMA (Q. & G.), subsp. VIOLACEA (Q. & G.).

Venus violacea, Q. & G.: Voy. Astrolabe, Zool., vol. iii (1834), p. 533, pl. lxxxiv, figs. 19–20.

A small orbicular subspecies with cutting margins, denticulated interiorly; subequilateral, slightly gibbous near the apex, regularly longitudinally grooved, lamellæ flat, directed upwards. The beaks are rounded, directed forwards, heart-shaped, also the lunule, which is short, sharply defined. The escutcheon is elongated and well marked. Colour reddish-violet with a few white spots and two rays of greenish colour descending from the umbones. Interior white, broadly bordered with violet. No anterior lateral tooth. Length 15·75, height 12·25, diam. 6·75 mm. (Q. & G.).

I cannot consider this more than a subspecies. It differs from the species chiefly in its colour and markings, and especially in the cordate, short lunule, which is much more like that of *crassa*.

CHIONE SUBSULCATA, n.sp.

Venus sulcata, Hutton: Proc. Linn. Soc. N.S. Wales (2), vol. i (1887), p. 226 (Wanganui System).

Venus sulcata, Hutton: Pliocene Moll. of N. Zeal., p. 81, pl. ix, fig. 87, in Macleay Memorial Vol., 1893.

Some months back, when arranging the New Zealand shells in the Colonial Museum, Wellington, I came across some recent valves of a *Chione* I had never seen before. They were collected by the late Mr. Traill near Stewart Island. I soon found out, however, that they are closely allied to Hutton's *Venus sulcata*.[1] In the Macleay Memorial Vol. Capt. Hutton seems to be rather doubtful whether the Pliocene form is identical with the Miocene. I have not seen Miocene specimens, but I have good examples from the Pliocene of Wanganui and Waikopiro, and these, as well as the recent specimens, show a character which was not mentioned by Capt. Hutton; they are all finely and closely radiately striated, the striæ running over the broad concentric ribs. This radiate striation is visible in some specimens to the naked eye, in others it can only be seen by the aid of a good lens. I have asked Professor W. B. Benham, curator of the Otago Museum, to kindly examine the type-specimen, which is from the Miocene of Napier, with regard to this radiate striation, and he informs me "that the concentric ridges are perfectly smooth; there are no striations visible even with a hand lens." Therefore the Pliocene and recent forms may be considered a distinct species, and require a new specific name.

The specimens I have seen show some variation in the proportion of the height to the length, viz.:—

The Pliocene type, according to Hutton, is	35 × 41 mm.,	ratio	1 : 1·17
My Pliocene specimen from Waikopiro is	31 × 36 ,,	,,	1 : 1·16
One recent valve from Stewart Island is	34 × 41 ,,	,,	1 : 1·2
Another ,, ,,	41 × 47 ,,	,,	1 : 1·15

The lunule in Pliocene and recent specimens is oblong cordate, striated, and well defined; the escutcheon long and narrow. The pallial sinus is short, pointing to the middle of the anterior adductor muscle. The margins of the valves are finely crenulated.

This is another example of one of our Pliocene molluscs having its existence down to the present time.

Type. — *Venus sulcata*, Hutton, of the Pliocene (1887), nec *V. sulcata*, Hutton, 1875.

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[1] Trans. N. Zeal. Inst., vol. vii (1875), p. 458, pl. xxi.